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ABSTRACT

Several factors have predicted participation in smoking cessation programs: (1) higher motivation or self-efficacy; (2) education; (3) smoking level; (4) smoking history; (5) quit attempts; and (6) health concerns. The variables that have predicted participation, however, generally have not predicted cessation. The transtheoretical model has described the stages and processes of change common to a variety of behavior changes. The stages have predicted changes in smoking behavior and an optimal pattern of stage by process activity has predicted quitting. This study explored the ability of the stages and processes of change, self-efficacy, and decisional balance to predict participation in group smoking cessation programs at three participation levels: (1) expressing interest in a cessation program; (2) selecting a specific program; and (3) attending a program's first session. The transtheoretical model's predictions for participation and quitting after 6 months were compared with those from a model based on demographic and smoking history predictors often cited in research. Subjects were volunteers selected from among self-change failures who had been participants in a longitudinal study evaluating minimal interventions for smoking cessations. The results indicate that transtheoretical model constructs are relevant for participation as well as cessation. In addition, smokers with higher levels of experiential processes like consciousness-raising are more likely to participate in the offered programs, and smokers who are more negative about smoking are more likely to ask for more help. Both the participation and quitting results provide further support for the transtheoretical model where higher levels of self-efficacy and behavioral processes contribute the most to change. (BF)

Predicting Participation in Smoking Cessation Programs

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Introduction

Several factors have predicted participation in smoking cessation programs: higher motivation or self-efficacy, education, smoking level, smoking history, quit attempts, and health concerns. However, the variables that have predicted participation generally have not predicted cessation (Biener & Adams, 1991; Cummings, Hellmann, & Emont, 1988; Glasgow, Klesges, Klesges, & Somes, 1988; Klesges, Brown, Pascale, Murphy, Williams, & Cigrang, 1988).

The transtheoretical model (Prochaska, DiClemente, & Norcross, 1992; DiClemente, 1993) has described the stages and processes of change common to a variety of behavior changes. The stages have predicted changes in smoking behavior (DiClemente, Prochaska, Velicer, Fairhurst, Rossi, & Velasquez, 1991), and an optimal pattern of stage by process activity has predicted quitting (Perz, DiClemente, & Carbonari, 1992).

This study explored the ability of the stages and processes of change, self-efficacy, and decisional balance to predict participation in group smoking cessation programs at three participation levels: expressing interest in a cessation program, selecting a specific program, and attending a program's first

session. The transtheoretical model's predictions for participation and quitting after six months were compared with those from a model based on demographic and smoking history predictors often cited in research.

Method

Subjects and Procedure

Subjects were volunteers selected from among self-change failures who had been participants in a longitudinal study evaluating minimal interventions for smoking cessation (DiClemente et al., 1991). During the 30th month follow-up for the longitudinal study, smoking subjects were invited to participate in a group cessation program (see Figure 1). Interested subjects then were offered a choice between two innovative two-session programs at a cost of $10.00: (a) Guide was a program that used guided imagery, hypnotic and deep relaxation techniques to break the smoking habit permanently; (b) Lifesign participants were instructed to use a hand-held monitor to monitor their smoking and to help them withdraw from smoking based on their own smoking pattern. Of those who selected a program, only 60% attended the first session of the program.

Measures

Measures made at the time of recruitment and six

months later (30th and 36th months, respectively, of the longitudinal study) were: (a) Smoking history and habit (number of cigarettes smoked per day, number of quit attempts in the past six months); (b) Smoking Abstinence Self-Efficacy (20 items; DiClemente, Prochaska, & Gibertini, 1985); (c) Temptation to Smoke scale (20 items; DiClemente et al., 1985); (d) Smoking Decisional Balance (20 items; Velicer, DiClemente, Prochaska, & Brandenburg, 1985); (e) Smoking Processes of Change grouped into one measure of experiential processes and one measure of behavioral processes of change (40 items; DiClemente & Prochaska, 1985; Prochaska, Velicer, DiClemente, & Fava, (1988); and (f) stage of change (categorical measure). In addition, subjects had reported age, income, education, and the number of years smoked.

Results

Of the 229 smoking subjects at the 30th month follow-up, 129 (56%) expressed interest in further help; of these, 87 (67%) chose one of the two programs; and of these, 52 (60%) attended the first session. Relationships between stage status and the three decisions were analyzed with chi-square analyses: Compared to smokers in the precontemplation stage, a

significantly higher percentage of contemplation and preparation stage smokers requested help, selected programs, and attended first sessions (see Table 1).

Separate discriminant analyses predicting the three participation decisions examined the influence of nine transtheoretical variables measured at the 30th month. These predictors significantly discriminated participants from nonparticipants on the decision to request more help; those who wanted more help had greater stage readiness, more experiential process activity, and higher cons of smoking than did the uninterested smokers (see Table 2). A model composed of demographic and smoking history variables did not significantly predict requesting more help. A model that combined the two models' predictors was significant, but none of the demographic/smoking history variables contributed significantly to predicting who was interested in participating in a smoking cessation program. Neither model significantly predicted choosing a program or showing up for treatment (likely due to loss of power from smaller samples and large number of predictors).

The transtheoretical and demographic/smoking history models also were compared on their ability to

predict quitting by the entire pool of subjects six months after the offer of treatment. As shown in Table 3, the transtheoretical model significantly discriminated quitters from those who did not quit; compared to nonquitters, successful quitters had quit more often in the prior six months, had higher levels of smoking abstinence self-efficacy, higher levels of behavioral process activity, and lower levels of temptation to smoke. The demographic/smoking history model did not predict quitting. The combination model significantly predicted quitting, but only one demographic variable contributed significantly--education level--and it was the fourth-strongest predictor contributing to discriminating between successful and unsuccessful quitters.

Discussion

These results indicate that transtheoretical model constructs are relevant for participation as well as cessation. Asking for help in a cessation program is driven by stage, process, and decisional variables. Smokers' stage of change predicts their participation in cessation programs, paralleling findings that linked stage of change with quitting (DiClemente et al., 1991). In addition, smokers with higher levels of

experiential processes like conscious-raising are more likely to participate in the offered programs, and smokers who are more negative about smoking are more likely to ask for more help. Greater readiness, engaging in activities most appropriate for becoming prepared for cessation, and more dissatisfaction with smoking are strong indicators of participation.

The transtheoretical constructs also predicted cessation. Compared to nonquitters, successful quitters had more recent quit attempts, higher smoking abstinence self-efficacy, lower levels of temptation to smoke, and higher levels of behavioral process activity. As in prior research, the constructs that predicted participation did not predict quitting.

Both the participation and quitting results provide further support for the transtheoretical model (see Figure 2). In the earlier stages of change such as Contemplation and Preparation, decisional balance and cognitive experiential processes are posited as active components of change; in later stages such as action or maintenance, higher levels of self-efficacy and behavioral processes contribute the most to change. Differential predictions for the early and later stages of change were substantiated by this study's results.

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Table 1
Summary of Stage Differences in Decisions to Seek Further Treatment

	Precontem-plation	Contem-plation	Prepar-ation	N =	χ^2 (df=2)
At 30th month	79	163	111	353 100%	
	↓	↓	↓		
Wanted more help	17 22%	72 44%	47 42%	136 39%	12.52**
	↓	↓	↓		
Selected a program (2 quit smoking, N = 351)	12 15%	43 26%	35 32%	90 26%	6.64*
	↓	↓	↓		
Showed up at first session (N = 351)	7 9%	27 17%	21 19%	55 16%	3.81

Percentages were calculated from the total number of subjects available at the 30th month.

* $p \leq .05$ ** $p \leq .01$

Table 2
Predicting Participation at Three Decision Points:
Discriminant Analyses with Transtheoretical Predictors

	Wilks' lambda	mult F	Significant Predictors
Interested in more help (N = 248, 136 were interested)	.907	(1,238) 2.70**	Higher stage, experiential processes[a], cons
Select a program (N = 134, 90 selected)	.964	(1,124) 0.51	na
Show up at treatment (N = 90, 55 showed up)	.793	(1,80) 2.34*	higher experiential processes[b]

* $p \leq .05$ ** $p \leq .01$

Transtheoretical Predictors: Number of quits in past six months, Mean number of cigarettes smoked per day in past week, SASE, Temptation, Pros, Cons, Stage of change, Experiential and Behavioral Processes

[a] Subjects who wanted more help used self-reevaluation and consciousness raising processes significantly more than subjects who did not want more help.

[b] Subjects who showed up at the first session used these experiential processes at higher levels: consciousness raising, social liberation, and dramatic relief.

Table 3
Predicting Quitting Six Months Later with Transtheoretical Predictors

	Wilks' lambda	mult F	Significant Predictors
Quit 6 months later (N = 194, 32 quit)	.887	(1,216) 3.05*	higher number of quits, confidence, behavioral processes[c]; lower temptation, cigarettes per day

* $p \leq .01$

Transtheoretical Predictors: Number of Quits in past six months, Mean number of cigarettes smoked per day in past week, SASE, Temptation, Pros, Cons, Stage of change, Experiential and Behavioral Processes

[c] Subjects who quit used two behavioral processes at higher levels: counterconditioning and reinforcement management.

Figure 1

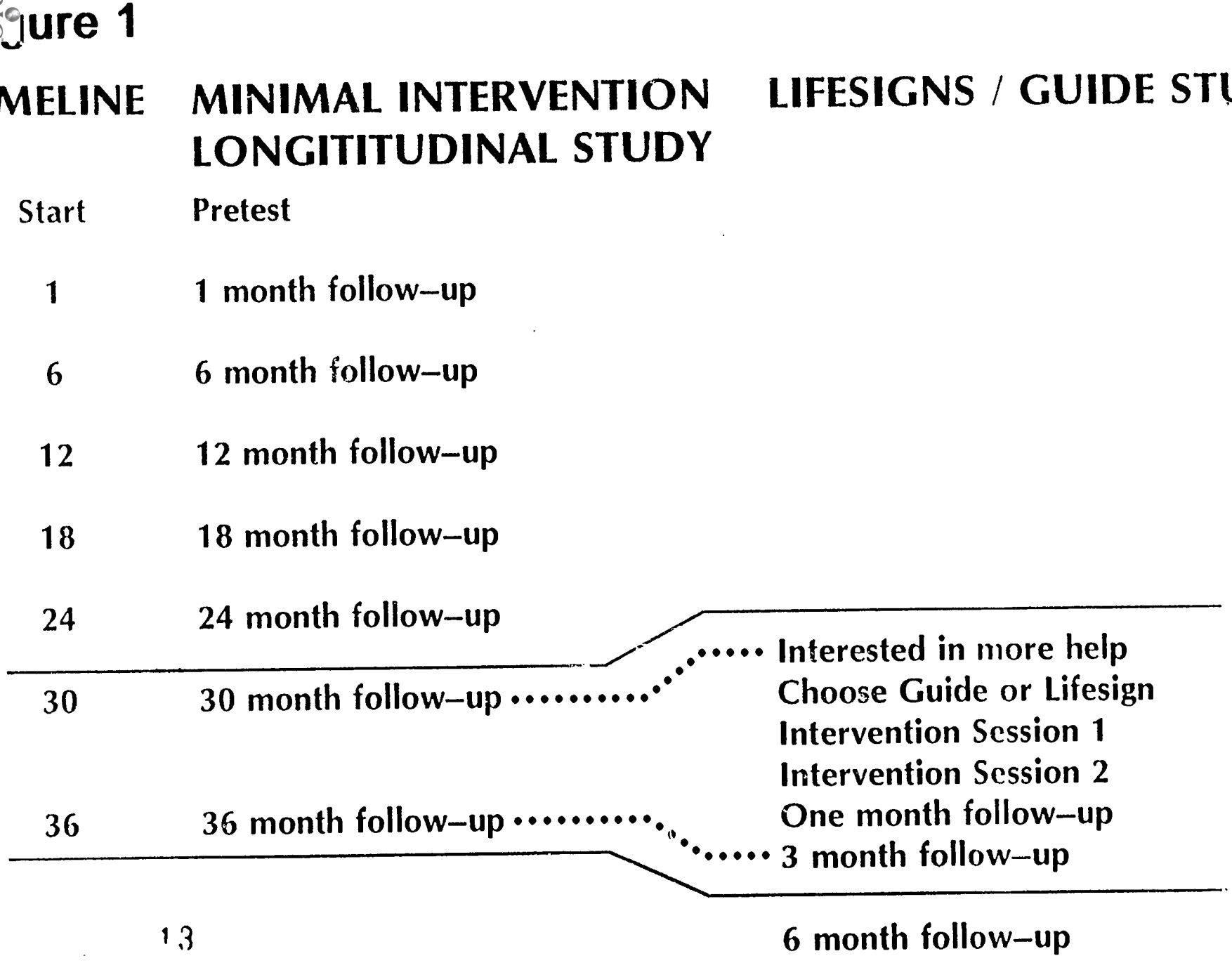
TIMELINE
MINIMAL INTERVENTION LONGITITUDINAL STUDY
LIFESIGNS / GUIDE STUDY
Start
Pretest
1
1 month follow–up
6
6 month follow–up
12
12 month follow–up
18
18 month follow–up
24
24 month follow–up
30
30 month follow–up
36
36 month follow–up
Interested in more help
Choose Guide or Lifesign
Intervention Session 1
Intervention Session 2
One month follow–up
3 month follow–up
6 month follow–up

Figure 2

Theoretical and practical considerations related to movement through the Stages of Smoking Cessation